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GEOGRAPHICAL PUBLICATIONS

(Reviews and Titles of Books, Papers, and Maps)

For key to classification see "Explanatory Note" in Vol. II, pp. 77-81

NORTH AMERICA

GENERAL

TYRRELL, J. B., edit. **David Thompson's narrative of his explorations in western America, 1784-1812.** lxiv and 582 pp.; maps, ills., index, bibliogr. The Champlain Society, Toronto, 1916. 10 x 7.

This narrative is an entertaining account of Thompson's travels, written by a natural story teller. His observations, covering a wide range of subjects, appear to have been systematic rather than haphazard, and to all Thompson gave the fullest contemplation. Naturally from a fur trader should come notes on the habits of animals, and such as Thompson gives are more than superficial jottings. Then again, Thompson spent much time among the Indians of the Northwest, and his ability to deal sympathetically with the various tribes not only enhanced his value as a fur-trader but also allowed him to learn and understand to a high degree their theory of life; thus making his accounts of the many tribes particularly trustworthy and valuable. To list the items which attracted the eyes and mind of Thompson would take much space; so many are they, so carefully does he record them, and so much did he do in opening the great Northwest that the reader, as he ends the final chapter and studies the maps, will agree with the editor that the life and work of such a man should not be allowed to lie in obscurity, but that some tribute should be made "as a token of respect for the man and his work."

Thompson traveled more than 50,000 miles in this time as a trader, and in addition to the immediate duty of seeking pelts he surveyed the entire area of his travels and checked much of his work by later surveys. Of his work as a surveyor, topographer, and geographer, the editor of this narrative, J. B. Tyrrell, a geologist familiar with the region of Thompson's labors, has the highest regard. To the strict test of surveys and observations on the ground Tyrrell subjected the work of Thompson and found the work "of the very highest order," and he at the same time formed so great an "admiration for this fur-trading geographer" that he has edited this volume as a monument to Thompson.

R. M. BROWN.

WOOD, R. K. **The tourist's Northwest.** xiv and 528 pp.; maps, ills., index. Dodd, Mead & Co., New York, 1916. 8 x 5.

The author's intentions have to be judged by the contents, as this volume is without an introduction. The Northwest as here presented includes the American Northwest of Oregon and Washington and also the Canadian Northwest of Alberta and British Columbia. Considerable space is devoted to hotels, railroads, and local itineraries. The author has collected the essential things that are of value for the tourist to these regions. Crater Lake, the Columbia River, and Mt. Rainier are given popular descriptions, accompanied by accurate information regarding rates and routes. In Canada the chief points are Glacier, Banff, Lake Louise, and Victoria. Some of the descriptions are well done and others are highly enthusiastic. The handbook contains an immense amount of information gained from chamber of commerce reports and popular publications. If this book is intended for the tourist on the road, its heavy covers, thick paper, and size make it a clumsy volume. It would have been better to make two volumes for the same material, finer type, smaller page, good local maps, and limp covers. The five maps are excelled by those generally furnished gratis by the railroads.

However, the tourist to the Northwest will find this handbook of value to use along with the latest Baedeker and especially the guide books issued by the respective governments.

W. M. GREGORY.

— **American Indian, A museum of the.** *The Outlook*, Vol. 114, 1916, Oct. 11, No. 6, p. 301. [Refers to the museum described in the December *Review*, pp. 407-418.]

ANDREWS, C. L. **Marine disasters of the Alaska route.** *Washington Hist. Quart.*, Vol. 7, 1916, No. 1, pp. 21-37. [The thousand-mile-long channel from Seattle to Skagway, Alaska.]

BLINK, H. **De scheepvaart- en scheepsbouwvraagstukken in Noord-Amerika.** *Diagr. Tijdschr. voor Econ. Geogr.*, Vol. 7, 1916, No. 3, pp. 89-99.

BURTON, C. M., AND M. A. BURTON, eds. **The journal of J[ohn] L[ees], of Quebec, merchant.** 55 pp.; maps, index. Soc. of Colonial Wars of the State of Michigan, Detroit, 1911. \$2.00. 9½ x 6. [Date: April to October, 1768; route: London, Boston, New York, Albany, Buffalo, Detroit, down Lakes Ontario and Erie and the St. Lawrence to Montreal.]

CAMPBELL, J. V. **The Sinclair party: An emigration overland along the old Hudson Bay Company route from Manitoba to the Spokane country in 1854.** *Washington Hist. Quart.*, Vol. 7, 1916, No. 3, pp. 187-201. ["This article was collated and prepared by Mr. William S. Lewis, from a series of letters written to him by Mr. John V. Campbell of Lillooet, British Columbia."]

DA VELLA, —. **La produzione del petrolio nel Nord-America in rapporto colla produzione mondiale petrolifera.** 13 pp. [Boll.] *Direz. Gen. degli Affari Commerc.*, 1915, No. 15. Minist. degli Affari Esteri, Rome.

FROTHINGHAM, E. H. **The northern hardwood forest: Its composition, growth, and management.** 79 pp.; map, ill. *U. S. Dept. of Agric. Bull. No. 285.* Washington, D. C., 1915. [For abstract, see the April, 1916, *Review* (Vol. I, p. 298).]

GRIFFIN, G. G., comp. **Writings on American history, 1913: A bibliography of books and articles on United States and Canadian history published during the year 1913, and some memoranda on other portions of America.** xvii and 193 pp.; index. Yale University Press, New Haven, 1915. \$2.00. 10 x 7. ["Eighth number of a continuous series opening with 1906."]

HEADLAM, CECIL. **America and West Indies, 1704-1705: Calendar of state papers, colonial series.** xl and 807 pp.; index. The Hereford Times, Ltd., London, 1916. 15s. 10½ x 7½.

MOLBECH, O. C. **Pelsvaerkshandelen i Nordamerika.** *Geografisk Tidsskrift*, Vol. 23, 1915-16, No. 5, pp. 179-188. Copenhagen.

NICKLES, J. M. **Bibliography of North American geology for 1915, with subject index.** 144 pp. *U. S. Geol. Survey Bull. 645.* Washington, D. C., 1916.

CANADA

Yukon, Northwest Territories, British Columbia

COLLISON, W. H. **In the wake of the war canoe: A stirring record of forty years' successful labor, peril, and adventure amongst the savage Indian tribes of the Pacific Coast and the piratical head-hunting Haidas of the Queen Charlotte Islands.** B. C. 352 pp.; map, ill., index. E. P. Dutton & Co., New York, 1916. 8 x 5.

The subtitle of this volume connotes a sensationalism which is entirely foreign to its contents, for it is indeed the simple narrative of the life of a pioneer missionary on the British Columbia coast. Into this have been woven many facts of ethnologic and historic interest. It is to be wished that Mr. Collison had made his record of fact relating to the primitive customs and mode of life of the Haidas more complete, for he was the first scholar to become intimately acquainted with these people.

The volume deals specifically with the Tsimshians of the Nass and Skeena River region, and with the Haidas of the Queen Charlotte Islands. An all too brief chapter is devoted to the Tsetsant (spelled Zitz-Zaow by the author) Indians. This tribe, now practically extinct, previously occupied Portland Canal and is a foreign element on the coast, for it belongs to the Athapascan stock of the interior.

In addition to containing much valuable ethnologic data, the volume also includes some important historical matter relating to the missions and the early settlements along the northwest coast of British Columbia. It is above all a valuable record of the conditions of travel and life during an epoch which has now passed, and presents a vivid picture of the conditions which confronted the pioneer missionary. The book contains many good halftones, chiefly illustrating Indian life. One of these shows a well-built truss bridge which, though evidently the work of white men, is credited to Indian craft. The map which accompanies the volume has nothing to recommend it. It is poorly drawn, badly reproduced, and so full of glaring errors as to disfigure a book that in other respects has been printed in very attractive form. A. H. BROOKS.

COOPER, W. S. **Plant successions in the Mount Robson region, British Columbia.** *Plant World*, Vol. 19, 1916, pp. 211-238.

Mount Robson is situated in the Canadian Rockies near the eastern boundary of British Columbia. It lies in a region which, so far as ecological study is concerned,

is unknown. The forests here are transitional between those of the Pacific Coast and those of the Rocky Mountains. Two forest zones are distinguished: the montane zone, extending up to 3,250 feet, and the sub-alpine zone, extending from 3,250 feet up to timber line at 6,500 feet. The climax forest in the montane zone, made up of *Thuja plicata*, *Picea Engelmannii*, *Tsuga heterophylla*, *Pseudotsuga mucronata*, and *Abies lasiocarpa*, is of the Pacific Coast type. The climax forest of the sub-alpine zone, consisting of *Picea Engelmannii* (dominant), *Abies lasiocarpa*, and *Pinus albicaulis*, and differing from that of the montane zone in the smaller number of species and in the smaller size of the trees, belongs rather to the Rocky Mountain region. The succession of plant associations on talus moraines and shingle flats is described in some detail. Successions in the two zones are much alike, and all of them lead to the establishment of a climax forest. Some interesting correlations are pointed out between the ages of trees growing on the successive terminal moraines of the retreating Robson Glacier and the rate of retreat.

GEORGE E. NICHOLS.

SHAW, C. H. **The vegetation of the Selkirks.** Map. *Botanical Gazette*, Vol. 61, 1916, No. 6, pp. 477-494.

Doctor Shaw, who was drowned in 1910, left a collection of notes from which this paper has been compiled.

The region of the Selkirks is entirely forest-clad up to the timber line, at an average elevation of 6,200 feet. Below 4,600 feet the forest may be classed as montane. It is broadly distinguished into eastern and western divisions by the greater luxuriance of the latter. The montane forest passes upwards into a sub-alpine formation, which, in turn, interlocks with alpine meadows. The limit between trees and grass is mainly governed by topography and exposure. Where sheltered depressions collect heavy, long-enduring snows, tree growth is suffocated and the tree line dips downwards. Snow and low temperatures control the upper limit of the meadows, but rock avalanches also constitute an ecological factor determining the occurrence of desert.

CAIRNES, D. D. **Mayo area; Scroggie, Barker, Thistle, and Kirkman Creeks; Wheaton District, Yukon Territory.** Maps, bibliogr. *Summary Rept. Geol. Survey of Canada for 1915*, pp. 10-49. Ottawa, 1916.

CAMSELL, CHARLES. **An exploration of the Tazin and Taltson Rivers, North West Territories.** 124 pp.; map, ills., index. *Geol. Survey of Canada Memoir 84: Geol. Series No. 69*. Ottawa, 1916. [Abstracted in the *October Review*, p. 302.]

CAMSELL, CHARLES. **Exploration in the northern interior of British Columbia.** Map, bibliogr. *Summary Rept. Geol. Survey of Canada for 1915*, pp. 70-75. Ottawa, 1916.

COLEMAN, A. P. **Glaciers of the Rockies and Selkirks.** 29 pp.; ills. Dominion Parks Branch, Dept. of the Interior, Ottawa, [1916?].

DAWSON, W. B. **Tide tables for the Pacific coast of Canada for the year 1917, including Fuca Strait, the Strait of Georgia, and the northern coast. With data for slack water in the navigable passes and narrows and information of currents.** 64 pp. Tidal and Current Survey, Dept. Naval Service of the Dominion of Canada, Ottawa, 1916.

DRYSDALE, C. W. **Bridge River map-area, Lillooet mining division; the Highland Valley copper camp, Ashcroft mining division; human skeleton from silt bed near Savona, British Columbia.** Maps, diags., bibliogr. *Summary Rept. Geol. Survey of Canada for 1915*, pp. 75-92. Ottawa, 1916.

DRYSDALE, C. W. **Geology and ore deposits of Rossland, British Columbia.** xviii and 317 pp.; maps, diags., ills., index, bibliogr. *Geol. Survey of Canada Memoir 77: Geol. Series No. 64*. Ottawa, 1915.

MACKENZIE, J. D. **Telkwa valley and vicinity, British Columbia.** Maps, bibliogr. *Summary Rept. Geol. Survey of Canada for 1915*, pp. 62-69. Ottawa, 1916.

— **Nakimu caves, The, Glacier Dominion Park, B. C.** 29 pp.; map, ills. Dominion Parks Branch, Dept. of the Interior, Ottawa, 1914.

— **Railway tunnel in America. The longest: The Roger's Pass bore through the Selkirk Mountains in British Columbia.** Map, diagr., ills. *Sci. Amer. Suppl.*, No. 2096, Vol. 81, 1916, Mar. 4, pp. 152-153.

SAPIR, E. **The social organization of the west coast tribes.** *Trans. Royal Soc. of Canada*, Ser. 3, Vol. 9, 1915, pp. 355-374.

SCHOFIELD, S. J. **Geology of Cranbrook map-area, British Columbia.** vii and 245 pp.; maps, diags., ills., index, bibliogr. *Geol. Survey of Canada Memoir 76: Geol.*

Series No. 62. Ottawa, 1915. [With a chapter on the regional physiography (Purcell Range) and a geological map, 1:126,720.]

— *White River district, Upper Yukon Territory.* 1:250,000. Geological Survey of Canada. Map 122A. [Ottawa], 1915.

UNITED STATES

General

MERENESS, N. D., edit. *Travels in the American colonies.* 693 pp.; index. The Macmillan Co., New York, 1916. \$3.00. 9 x 5½.

This book is a transcription of eighteen manuscripts which contain the records of divers journeys and missions in the American colonies between the years 1690 and 1783. The editing of the travels has been done carefully; each manuscript is introduced by a brief statement which gives as far as it is known the purpose of the journey, the political situation along the route, and pertinent extracts from the life of the participant. A wide range of subjects is treated in the volume, and a more personal touch with the conditions under which the colonists lived is vouchsafed the reader than can be obtained from an interpretation by an historian. Among the manuscripts there may be found a journey from Virginia to New England in 1690 on a political mission, an account of a year's captivity among the Cherokee Indians, missions to the Creeks and the Choctaws, the migration of the Moravians from Pennsylvania to North Carolina, a visit from New York to Philadelphia during the troublous days of 1778, and the travels of a bishop and his party to fulfill their duties. This group of travelers, not unlike modern explorers, show a wide variation in the kinds of material noted as of value. In a number of instances, as particularly in Cuthbert Potter's journal, when the traveler was not directly concerned with his mission, the notes deteriorate to a mere mention of the stages of the journey, while in others, the journal of Diron D'Artaguette of Louisiana for example, the reader gains an insight into the stage of culture, the climate, and the vegetation, as well as into the political status of the land.

R. M. BROWN.

PUTNAM, G. R. *The Lighthouse Service and its relation to the United States Coast and Geodetic Survey.* *Science*, May 12, 1916, p. 670. [Abstract of an address at the centennial exercises of the U. S. Coast and Geodetic Survey.]

ROMAN, C. V. *American civilization and the negro.* xii and 434 pp.; ills., glossary, index. F. A. Davis Co., Philadelphia, 1916. \$2.50. 9½ x 6. [For extended review, see article "Our Immigrant Problem," by Ellsworth Huntington in the December, 1916, *Review*, pp. 458-463.]

ROSS, E. A. *The Old World in the New: The significance of past and present immigration to the American people.* viii and 327 pp.; maps, diagrs., ills., index. The Century Co., New York, 1914. \$2.40. 8½ x 6. [For extended review, see article "Our Immigrant Problem," by Ellsworth Huntington in the December, 1916, *Review*, pp. 458-463.]

SCHOFF, W. H., edit. [Report of proceedings of] *Eighth annual convention of the Atlantic Deeper Waterways Association held at Savannah, Georgia, November 9, 10, 11, and 12, 1915, with preliminary sessions at Richmond, Va., Raleigh, N. C., and Columbia, S. C., November 7 and 8, 1915.* 311 pp.; maps, ills. Atlantic Deeper Waterways Association, Philadelphia, 1916.

SCHUCHART, T. *Der Aussenhandel der Vereinigten Staaten von Amerika: Eine statistische Studie.* 34 pp.; diagrs. *Meereskunde: Sammlung volkstümlicher Vorträge*, Vol. 9, 1915, No. 11. Berlin.

SMITH, G. O. *The United States Geological Survey and its relation to the United States Coast and Geodetic Survey.* *Science*, May 12, 1916, pp. 659-665. [Address at the centennial exercises of the U. S. Coast and Geodetic Survey.]

SMITH, H. M. *The Bureau of Fisheries and its relation to the United States Coast and Geodetic Survey.* *Science*, May 12, 1916, pp. 665-666. [Abstract of an address at the centennial exercises of the U. S. Coast and Geodetic Survey.]

— *State supplements to Frye's Primary Geography:* (1) *The New England States.* By J. S. Vaughn. 8 pp. [1915]. (2) *Middle Atlantic States.* 18 pp. [1915]. (3) *Washington and the District of Columbia.* By Ella Given. 6 pp. (4) *Central States (Eastern Section).* 8 pp. [1915]. (5) *State of Washington.* 8 pp. [1915]. Ginn & Co., Boston. 10 x 8.

— *State supplement to Frye's Home Geography:* (1) *New Jersey.* 10 pp. 1912. (2) *Pennsylvania.* 14 pp. 1912. (3) *Washington.* 9 pp. 1912. Maps, ills. in each. Ginn & Co., Boston. 8 x 6 each.

— **State supplements to Frye's Higher Geography:** (1) **Delaware.** By E. L. Cross. 12 pp. 1915. (2) **Mississippi.** By J. N. Poers. 16 pp. 1915. (3) **New Jersey.** By Ella Huntington. 15 pp. 1914. (4) **South Carolina.** By Frank Evans. 12 pp. 1906, 1912. Maps, ill. in each. Ginn & Co., Boston. 12 x 10 each.

— **State supplements to Maury's New Geographies:** (1) **Texas.** By R. T. Hill. 18 pp. 1908, 1912. (2) **Virginia.** By W. J. McGee. 18 pp. 1908. Maps, diagrs., ill. in each. American Book Co., New York. 12 x 10 each.

— **State supplements to Redway and Hinman's Natural Geographies:** (1) **Alabama.** By J. L. M. Curry. pp. 1-6. 1898, 1913. **Mississippi.** By J. L. M. Curry. pp. 7-12. 1898, 1913. **Louisiana.** By W. W. Clendenin. pp. 13-17. 1898, 1913. **Arkansas.** By A. H. Purdue. pp. 18-22. 1898, 1913. (2) **California.** 12 pp. 1899. (3) **Colorado.** 13 pp. 1914. (4) **Florida.** By W. F. Yocum. 12 pp. 1910, 1913. (5) **Georgia.** By D. Q. Abbott. 7 pp. 1898. (6) **Idaho.** 12 pp. 1907, 1914. (7) **Illinois.** 12 pp. 1908, 1913. (8) **Indiana.** By C. R. Dryer. 12 pp. 1909. (9) **Iowa.** By George Chandler. 9 pp. 1898, 1907, 1912. (10) **Kentucky.** 10 pp. 1909, 1914. (11) **Maine.** By W. W. Stetson. pp. 1-7. 1898, 1913. **New Hampshire.** By L. J. Rundlett. pp. 8-13. 1898, 1913. **Vermont.** pp. 14-17. 1898, 1913. **Massachusetts.** By J. C. Lyford. pp. 18-26. 1898, 1913. **Connecticut.** pp. 27-34. 1898, 1913. **Rhode Island.** pp. 35-38. 1898, 1913. (12) **Maryland.** By C. L. Garrison. pp. 1-7. 1898, 1913. **Delaware.** By C. L. Garrison. pp. 8-9. 1898, 1913. **District of Columbia.** By C. L. Garrison. pp. 10-14. 1898, 1913. (13) **Michigan.** By L. H. Wood. 16 pp. 1910, 1914. (14) **Minnesota.** By C. W. G. Hyde. 10 pp. 1898, 1914. (15) **Missouri.** By J. A. Merrill. 10 pp. 1898, 1907, 1912. (16) **Montana.** 20 pp. 1912. (17) **Nebraska.** By C. G. Pearce. 10 pp. 1898, 1908, 1913. (18) **Nevada.** 6 pp. 1907. (19) **New Mexico.** By C. M. Light. 12 pp. 1912. (20) **New York.** 27 pp. 1912, revised to 1915. (21) **North Carolina.** By Collier Cobb. pp. 1-8. 1898, 1913. **South Carolina.** By L. C. Glenn. pp. 9-14. 1898, 1913. (22) **North Dakota.** By L. L. Perrine. 12 pp. 1912, revised 1915. (23) **Ohio.** By W. M. Gregory. 20 pp. 1914. (24) **Oklahoma.** 10 pp. 1908, 1912. (25) **Oregon.** 10 pp. 1907. (26) **Pennsylvania.** By M. G. Brumbaugh. pp. 1-10. 1898, 1913. **New Jersey.** By V. L. Davey. pp. 11-16. 1898, 1913. (27) **South Dakota.** By Doane Robinson. 12 pp. 1912, revised 1915. (28) **Tennessee.** By J. M. Safford. 8 pp. 1898, 1909, 1913. (29) **Utah.** By J. H. Paul. 20 pp. 1908, 1912. (30) **Washington.** By Solon Shedd. 16 pp. 1910, 1912. (31) **West Virginia.** By R. A. Armstrong. 16 pp. 1912, revised to 1915. (32) **Wisconsin.** By R. G. Thwaites. 8 pp. 1898, 1911. (33) **Wyoming.** 11 pp. 1914. Maps, diagrs., ill. in each. American Book Co., New York. 12 x 10 each.

STRATTON, S. W. **The Bureau of Standards and its relation to the United States Coast and Geodetic Survey.** *Science*, May 12, 1916, p. 667. [Abstract of an address at the centennial exercises of the U. S. Coast and Geodetic Survey.]

TITTMANN, O. H. **The international work of the United States Coast and Geodetic Survey.** *Science*, May 12, 1916, p. 672. [Abstract of an address at the centennial exercises of the U. S. Coast and Geodetic Survey.]

— **United States, Statistical abstract of the, 1915.** 749 pp.; index. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C., 1916.

— **United States Coast and Geodetic Survey, The one-hundredth anniversary of the.** *Science*, May 12, 1916, pp. 655-674. [The papers and abstracts constituting this article are listed individually.]

WAINWRIGHT, RICHARD. **The Civil War record of the United States Coast and Geodetic Survey, and what the Survey is doing towards preparedness.** *Science*, May 12, 1916, pp. 671-672. [Abstract of an address at the centennial exercises of the U. S. Coast and Geodetic Survey.]

YARD, R. S. **Glimpses of our national parks.** 37 pp.; map. Dept. of the Interior, Washington, 1915. [See also "Personal" item in this number, p. 155.]

North Atlantic States

MCADIE, ALEXANDER. **The winds of Boston and vicinity.** Diagrs. *Annals Astron. Observ. Harvard College*, Vol. 73, 1916, Part 3, pp. 211-231. Cambridge, Mass.

Professor McAdie's discussion of the winds of Boston and its vicinity forms part of the "Observations and Investigations made at the Blue Hill Meteorological Observatory in the Year 1915." This observatory is remarkably well located for the study of just such subjects as that here investigated. Blue Hill, while not high (640 feet, 195 meters), has a very free exposure; its records have now been kept for a period of over thirty years, practically without change in methods or exposure, and the highest standard of

accuracy has been maintained from the beginning. We have, in the present monograph, a very complete discussion of the winds at Blue Hill, not only as to the ordinary details of direction and velocity, but also as to the correlations between the winds and other weather conditions.

The drift of the surface currents, also of those at higher levels, is from a point slightly north of west. Wind roses show the percentages of frequency of the different wind directions seasonally and for the year. In general, months of excessive rainfall are months in which the northeast wind has a maximum duration. Dry periods are characterized by an excess of west wind. It is clearly pointed out that our Atlantic seaboard is as dry as it is because the prevailing winds blow from the land. "If it were possible to reverse the surface circulation and substitute for the west wind the east wind, the total rainfall would be 50 per cent greater and the number of rainy days exceed 250 instead of the present number, 106." This is an interesting statement. Professor McAdie introduces a new term (p. 220) when he uses *equivents* (cf. *equipluves*) for the departure of the monthly wind velocities from the norm. The relation of wind direction and temperature is strikingly illustrated by means of two figures, which are reproductions of the instrumental records. The sea breeze at Blue Hill is easily distinguishable from the cyclonic northeast wind ("sea-turn"). The latter has a greater depth and gives a more uniform decrease of temperature. It is noteworthy that a violent thunderstorm does not cool the air as effectively as does the sea-breeze (Fig. 17). Various other relations of winds are considered, e. g. winds and cloudiness, winds and pressure, variation of velocity with elevation, frequency of winds of constant velocities, etc.

Professor McAdie seems to us to have succeeded admirably in condensing a very large amount of information into a very small compass, with a commendable omission of the customary "dry" tabulations, and with an excellent series of carefully selected, clear, and interesting illustrations.

R. DEC. WARD.

EUROPE

SWITZERLAND OR THE ALPS

LUCERNA, ROMAN. **Morphologie der Montblancgruppe.** 187 pp.; map, diagrs., ills. *Ergänzungsheft zu Petermanns Mitt. Nr. 181.* Justus Perthes, Gotha, 1914.

The verbal description of mountain forms is one of the most difficult problems in geography. In illustration of progress toward its solution, a comparison may be made between the description of the Mt. Blanc group by the eminent French architect Viollet-le-Duc (1877) and the present monograph, for the later work gives the most advanced and detailed statement of the thesis, already supported by Hess and others as regards trough-valleys, that the work of successive epochs and stages of decreasing glaciation is recognizable in a corresponding succession of cirques and troughs, of which the smaller and deeper ones of later excavation are "nested" in the larger and shallower ones of earlier excavation: the sharpened ridges between the cirques are thus correlated with the terminal moraines at the lower ends of the troughs. It would be hazardous to express an opinion on the correctness of this interpretation without reviewing the facts on the ground, but it is safe to say that Lucerna's study appears to be based on abundant and careful local observation and that his conclusions are well worked out. American alpinists might, it would seem, add a zest to their adventurous explorations by attempting the application of Lucerna's thesis in the strongly glaciated mountain groups of the Canadian ranges, and thus at least supplement if not replace their personal narratives with objective mountain analysis.

W. M. DAVIS.

BEAUFOY, MARK. **Narrative of a journey from the village of Chamouni, in Switzerland, to the summit of Mount Blanc, undertaken on the 8th of August, 1787.** 111s. *Alpine Journ.*, Vol. 29, 1915, No. 210, pp. 323-333. [From the original manuscripts in the archives of the Royal Society, which remained unprinted until 1817. With a note, pp. 331-333, by Douglas W. Freshfield.]

BERNHARD, HANS. **Veränderungen in der Bodenkultur des Kantons Zürich.** Maps, diagr. 14. u. 15. *Jahresbericht der Geogr.-Ethnogr. Gesell. in Zürich (1913-14 und 1914-15)*, pp. 3-28.

GHEZZI, C. **Die Abflussverhältnisse des Rheins in Basel.** 137 pp.; maps, diagrs., ills. *Mitt. der Abteilung für Wasserwirtschaft Nr. 8.* Dept. des Innern, Bern, 1915.

GIRARDIN, M. **Les bassins fermés des Alpes suisses.** *Bull. Soc. Fribourgeoise des Sci. Nat.*, 1913-14, Vol. 22, 1914, p. 15.

GOCKEL, A. **Das Wetter in Freiburg im Jahre 1914.** *Bull. Soc. Fribourgeoise des Sci. Nat.*, 1913-14, Vol. 22, 1914, pp. 59-65.

KNAPP, C. A propos des premiers cartographes neuchâtelais, Josué Perret-Gentil, le Père C. Bonjour, David-François de Merveilleux. *Bull. de la Soc. Neuchâteloise de Géogr.*, Vol. 24, 1915, pp. 24-41.

MONTAGNIER, H. F. A further contribution to the bibliography of Mont Blanc, 1786-1853. Ills. *Alpine Journ.*, Vol. 30, 1916, No. 212, pp. 114-138. [Supplementary to the list contained in the *Alpine Journ.*, Vol. 25, 1911, pp. 608-640.]

MONTAGNIER, H. F. Articles on the first ascent of the Jungfrau. *Alpine Journ.*, No. 210, Vol. 29, 1915, pp. 333-336.

NÄF, J. Graphische Darstellungen der Schweizerischen hydrometrischen Beobachtungen im Jahr 1913. 27 plates and 14 pp. of text. *Veröffentl. der Abteilung für Wasserwirtschaft* [no number]. Dept. des Innern, Bern, 1915.

NUSSBAUM, F. Heimatkunde von Bern und Umgebung: Orographie und Geologie. 24 pp.; maps, diagrs. Stämpfli & Cie., Bern, 1916.

OTT, ADOLF. Die Siedelungs-Verhältnisse beider Appenzell. Maps, ills., bibliogr. 14. u. 15. Jahresbericht der Geogr.-Ethnogr. Gesell. in Zürich (1913-14 und 1914-15), pp. 35-62 + 45 pp.

ROTHEY, L. La géographie humaine dans le Jura bernois. *Bull. Soc. Fribourgeoise des Sci. Nat.*, 1913-14, Vol. 22, 1914, pp. 32-35.

BALKAN STATES, INCLUDING RUMANIA

FORBES, NEVILL, A. J. TOYNBEE, D. MITRANY, AND D. G. HOGARTH. **The Balkans: A history of Bulgaria, Serbia, Greece, Rumania, Turkey.** 407 pp.; maps, index. The Clarendon Press, Oxford, 1915. 8 x 5½.

Four authors have co-operated to present within four hundred pages the histories of five different nations. Forbes tells the story of both Bulgaria and Serbia, while Toynbee writes of Greece, Mitraný of Rumania, and Hogarth of Turkey. Each author worked independently, without opportunity of conferring with his collaborators, a circumstance which explains some lack of unity in style, and a certain amount of repetition in the several sections of the book. The chief merit of the volume is that it gives to the reader a valuable, up-to-date résumé of the historical background against which the tragic events of the present must be projected if an intelligent appreciation of Balkan problems is to be secured. For this purpose it may seem that the ancient history of several of the nations might profitably have been still further abbreviated.

The book is a history, not a geography of the Balkan peninsula; but the geographer will find within its pages the records of events clearly reflecting the profound influence of physical environment upon the progress of man's development in this highly interesting section of the world. Often, indeed, the connection between physical cause and political effect is explicitly stated. The rôle of parallel folded mountains bordering the Adriatic shore as an obstacle to any extension of Serbian power to the seacoast; the effect of the mountainous interior in preventing the complete subjugation of Serbia by Turkey, and in insuring to Montenegro a still greater freedom from Turkish domination; the importance of the Save-Danube channel as a military obstacle and a political frontier, and of the Morava-Maritza and Morava-Vardar trenches as guiding lines for Slavonic and other migrations: these and other distinctly geographic problems are repeatedly brought to the reader's attention, though seldom discussed at any length.

DOUGLAS W. JOHNSON.

KRUSCH, [PAUL]. Die nutzbaren Lagerstätten der Türkei und Bulgariens und ihre Bedeutung für die Zentralmächte. Maps. *Berliner Tageblatt: Wochenausgabe*, No. 52, Vol. 4, 1915, pp. 14-16. [Abstracted under the title "Bulgarian and Turkish Mineral Resources" in the June, 1916, *Review* (Vol. 1, pp. 459-460).]

MARTEL, E. A. L'Albanie. Ills. *La Nature*, No. 2209, 1916, Jan. 29, pp. 65-70.

PITTARD, EUGÈNE. Les peuples de la péninsule des Balkans: Esquisse anthropologique. *Rev. Gén. des Sci.*, Vol. 26, 1915, No. 23, pp. 665-675.

ITALY

ANFOSSI, G. Volumetria della Sardegna (Studi orometrici, II). Maps, diagrs. *Memorie Geogr.* (Suppl. to *Riv. Geogr. Italiana*) No. 28 (=Vol. 9, pp. 183-234). Florence, 1915.

Sardinia has a volume (above sea-level) of 8,206 cubic kilometers, a mean height of 344 meters, with an area of 23,833 square kilometers. To ascertain the first two facts the author divides his island into 23 regions, the plain of the Campidano, and hill and mountain masses that are more or less separated from their neighbors by distinct valleys.

Gennargentu, near the middle of the island, is the largest and culminates at 1,834 meters. The area of each district was measured with an Amsler planimeter for each 200-meter contour of the 1:100,000 map, and from these measures the areas ascertained for each belt between contours. By Simpson's formula, if these areas are called $a_0, a_1, a_2, \dots, a_{n-1}, a_n$, and H be the vertical distance between contours, the volume, V , will be $V = \frac{H}{3} (a_0 + 4a_1 + 2a_2 + 4a_3 + 2a_4 + \dots + 2a_{n-1} + a_n)$ supposing there be an even number of areas. If there be an odd one its volume must be computed as that of a pyramid and added on.

Graphs have been computed for the slope of each district, taking areas at each 200-meter contour as abscissas and the elevations corresponding as ordinates. In another set of graphs the abscissas are the radii of the circles with the same area as the figure contained by the corresponding contour. Then profiles were platted of the boundary of each district and the mean elevation of the *base* of the district thus ascertained. Then the middle of each district was marked with its mean altitude, and, by distributing the other 100-meter elevations equally between these points and the nearest points of the coast, arbitrary contours of mean elevation are constructed.

Such are the processes that make up an orometric study.

MARK JEFFERSON.

ACCOMAZZO, PERICLE. **Il Lago di Candia nel Canavese: Osservazioni fisiche e batometriche.** Diagr., ills. *Boll. della Reale Soc. Geogr. Italiana*, Vol. 5, 1916, No. 7, pp. 575-605. Rome.

ALMAGIÀ, ROBERTO. **La cartografia del Lazio nel cinquecento.** *Riv. Geogr. Italiana*, Vol. 23, 1916, No. 1, pp. 25-44. Florence. [On maps of Latium of the fifteenth century.]

BELL, R. H. **Taormina.** xxiv and 172 pp.; ills. Hinds, Noble & Eldredge, New York, [1916]. 8 x 5. [A charming account of a quiet Sicilian town with glimpses at its environment and its history.]

BRIGG, J. J. **Through the Maritime Alps.** ills. *Alpine Journ.*, No. 210, Vol. 29, 1915, pp. 300-311.

BRUNO, A. **Il transito attraverso i porti italiani del commercio con l'Africa.** *L'Africa Italiana*, Vol. 34, 1915, No. 8, pp. 206-216; No. 9, pp. 291-295. Naples.

CALIMANI, FELICE. **I profughi di guerra italiani rimpatriati attraverso alla Svizzera.** Maps, ills. *Boll. della Emigrazione*, Vol. 15, 1916, No. 3, pp. 5-35. R. Commiss. della Emigr., Rome.

— **Emigrazione italiana transoceanica negli anni 1914 e 1915, Notizie statistiche riassuntive sulla, e operazioni relative di vigilanza e di tutela del Commissariato della Emigrazione.** *Boll. della Emigrazione*, Vol. 15, 1916, No. 2, pp. 3-51. R. Commiss. della Emigr., Rome.

IORE, OTTO DE. **I fenomeni avvenuti a Volcano (Isole Eolie) dal 1890 al 1913.** Diagr., bibliogr. *Zeitschr. für Vulkanologie*, Vol. 1, 1914, No. 2, pp. 57-73; Vol. 2, 1915, No. 1-2, pp. 12-66.

HESS, ADOLFO, AND M. C. SANTI. **La Torre di Lavina m. 3308 (Gruppo del Gran Paradiso).** ills., bibliogr. *Riv. Mensile Club Alpino Italiano*, Vol. 35, 1916, No. 1, pp. 14-21.

HUTTON, EDWARD. **Naples and southern Italy.** xi and 312 pp.; ills., index. The Macmillan Co., New York, 1915. \$2. 7½ x 5. [A book of more than ordinary charm. It subordinates present-day descriptions. Side lights from history, the doings of great men, events out of the common that stamped each place or region with character and gave it a distinctive atmosphere are the main themes.]

KEBLINGER, WILBUR. **Malta.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 20a, pp. 5-8. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

LOTTI, B. **Le tremblement de terre de la Marsica dans l'Apennin central.** ills. *La Nature*, No. 2215, 1916, Mar. 11, pp. 161-163.

MASON, C. A. **The spell of southern shores, or from sea to sea in Italy.** x and 428 pp.; ills., index. The Page Co., Boston, 1915. \$2.00. 8½ x 5½.

MODERNI, POMPEO. **Su la conca di Bolsena: A proposito di una nota del Dott. H. Simotomai.** Diagr. *Boll. del R. Comitato Geol. d'Italia*, Vol. 45, 1915, No. 1-2, pp. 93-108. [On the "crater lake" of Bolsena, 50 miles northwest of Rome. The article to which this is a rejoinder appeared in the same journal, Vol. 44, 1914, No. 2.]

— **Servizio Meteorologico, Norme ed istruzioni per il.** 61 pp.; diagr., ills. *Ufficio Idrografico Pubbl. N. 53.* R. Magistrato alle Acque, Venice, 1916.

VIÉZZOLI, FRANCESCO. *La Venèzia Giulia*. Map. *La Geogr.*, Vol. 3, 1915, No. 7-10, pp. 242-294. Novara.

VITALE, L. *L'Adriatico, mare nostro*. *L'Esplorazione Commerc.*, Vol. 31, 1916, No. 6, pp. 206-222.

AFRICA

SOUTH AFRICA

— **Cape Province, Development of irrigation in.** *Board of Trade Journ.*, No. 1,031, Vol. 94, 1916, pp. 639-640.

CLERICI, ALESSANDRO. *Igiene e medicina tropicale: Risorse naturali dell' Africa sud-occidentale tedesca*. *Riv. Coloniale*, Vol. 11, 1916, No. 7, pp. 399-404.

CORDEAUX, H. E. S. *St. Helena: Report for 1915*. 18 pp. *Ann. Colonial Repts.* No. 896. London, 1916.

DORNAN, S. S. *Rhodesian ruins and native tradition*. Ills. *South African Journ. of Sci.*, Vol. 12, 1916, No. 11, pp. 502-516. [Abstracted in the *January Review*, p. 72.]

DYE, J. W. **Cape Town.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 66a, pp. 8-13. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

ELLENBERGER, J. **Bechuanaland Protectorate: Report for 1915-1916**. 7 pp. *Ann. Colonial Repts.* No. 898. London, 1916.

FOX, H. W. **The development of Rhodesia from a geographical standpoint.** Map, ill. *Geogr. Journ.*, Vol. 48, 1916, No. 4, pp. 289-305.

GUNSAULUS, E. N. **Johannesburg.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 66a, pp. 13-23. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

GUNSAULUS, E. N. **Rhodesia.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 66a, pp. 23-31. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

GUNSAULUS, E. N. **Union of South Africa.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 66b, pp. 5-14. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

HEISLER, C. H. **British South Africa.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 66a, pp. 1-8. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

KEHOE, D. **The influence of the climatic and tellurical factors on the distribution and spread of certain animal diseases, with special reference to the conditions occurring in South Africa.** *South African Journ. of Sci.*, Vol. 12, 1916, No. 11, pp. 474-501.

KINGON, J. R. L. **Native agriculture.** *South African Journ. of Sci.*, Vol. 12, 1915, No. 5, pp. 178-191.

KINGON, J. R. L. **The economics of the east coast fever as illustrated by the Transkeian Territories.** *South African Journ. of Sci.*, Vol. 12, 1916, No. 6, pp. 213-226. [The Transkei Territories lie "beyond" the Great Kei River on the east coast of the Cape of Good Hope province. The article is abstracted in the *January Review*, pp. 72-73.]

MARLOTH, RUDOLF. **The effects of droughts and of some other causes on the distribution of plants in the Cape region.** *South African Journ. of Sci.*, Vol. 12, 1916, No. 9, pp. 383-390. [Records the effect of the remarkably severe drought of 1914 in the Cape peninsula. The author's observations confirm the importance of the south-east mountain cloud as a source of moisture.]

MASTERSON, W. W. **Durban.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 66a, pp. 37-39. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

MULLER, H. P. N. **Did Holland sell the Cape?** *Tijdschr. van het Kon. Nederl. Aardrijks. Genoot.*, Vol. 33, 1916, No. 5, pp. 661-664.

MURPHY, G. H. **British South Africa.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 66b, pp. 1-5. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

PETTMAN, CHARLES. **An inquiry into the derivation of certain South African place-names.** *South African Journ. of Sci.*, Vol. 12, 1915, No. 5, pp. 159-170. [Amongst the names is that of Walvis Bay. This form of spelling, authorized by the

Government, has aroused much etymological discussion. The author is satisfied that the earliest of the many forms is that of Walvisch Baai, which appears on Rochette's map of 1782.]

SCHWARZ, E. H. L. **The fault systems in the south of South Africa.** *South African Journ. of Sci.*, Vol. 12, 1916, No. 9, pp. 367-382.

SPENCE, J. O. **Mozambique province.** 6 pp. *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 76a. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

STEWART, T. A. **Swaziland: Report for 1915-16.** 15 pp. *Ann. Colonial Repts.* No. 901. London, 1916.

TOIT, P. J. DU. **South African agriculture: An analysis.** *South African Journ. of Sci.*, Vol. 12, 1915, No. 5, pp. 145-155. [The principal agricultural industries are briefly surveyed, some attention being paid to the complicated human factor in the history of the development. That population is a prerequisite for further expansion is the conclusion of the writer.]

VERSFELD, WILLEM. **Notes on the chemistry of the Inaras (*Acanthosicyos horrida hook.*).** Ills. *South African Journ. of Sci.*, Vol. 12, 1916, No. 6, pp. 232-238. [The Inaras (! represents a palatal click) is a cucurbitaceous plant flourishing in the dune region round Walvis Bay. The features of its habitat are a dry, warm climate, incessant winds, loose sandy soil extraordinarily rich in potash, and a good deep-seated water supply. In its adaptation to desert conditions the plant has naturally become highly specialized. It is characterized by enormous roots and the elimination of leaves. It produces as fruit a small melon, an excellent nutritive food which with fish forms the exclusive diet of the Hottentot and Bushmen dwellers of the region. (See also reference in the note on "The Physical Subdivisions of Southwest Africa" in the August, 1916, *Review*, pp. 155-156.)]

WAKEFIELD, E. A. **Port Elizabeth.** *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 66a, pp. 32-37. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

ASIA

TURKEY IN ASIA, ARABIA, CAUCASIA, IRAN

WARFIELD, WILLIAM. **The gate of Asia: A journey from the Persian Gulf to the Black Sea.** x and 374 pp.; ill. G. P. Putnam's Sons, New York and London, 1916. \$2.50. 8½ x 6.

At the beginning of his book Mr. Warfield states that the object of his expedition "was to pursue certain scientific studies" because he believes that "the unnoticed and comparatively insignificant mountains of Kurdistan form an important link between the mountain systems of Europe and Asia." The reader is nowhere troubled by these scientific studies, however, for the author devotes himself almost exclusively to a pleasant account of his experiences, interlarded with discussions of history. Before the war he started from the head of the Persian Gulf, went up the Tigris to Bitlis and Van, and came back to civilization by way of Urmi and the Russian Caucasus. His volume is a typical book of travel. No remarkable adventures were experienced, no new routes were traversed, and no discoveries were made. Nevertheless it is worth reading.

Certain little episodes are highly illuminating. For example, Mr. Warfield saw an old Nestorian woman who was stolen from her Christian home in childhood, lived in a Kurdish harem, and had not seen a Christian for sixty years. He entertains no very high idea of the Armenians, although he acknowledges their ability. He thinks that the village Armenians are largely of Parthian descent, and that the town Armenians are partly Jewish. The Kurds and Yezidis seem to appeal to him. His descriptions of people are excellent.

One of the few scientific points upon which Mr. Warfield expresses an opinion is changes of climate. Many facts, such as the vast armies of Darius, and still more the fact that he brought to Arbela fifteen elephants from the present deserts on *this* side of the Indus, "provide one of the most striking proofs of the tremendous variations which have taken place in the climate of the whole northern hemisphere in historic times." He states that "conditions in the southern hemisphere are of course the exact opposite" of those in the northern, but of this he gives no proof.

ELLSWORTH HUNTINGTON.

BADER, R. H. **Persia.** 7 pp. *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 57a. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

CAPRA, GIUSEPPE. **La colonizzazione agraria in Siria e Asia Minore.** Ills. *Italica Gens*, Vol. 6, 1915, No. 3-6, pp. 65-89. Turin.

FRANCHETTI, LEOPOLDO. *Il futuro assetto dell' Asia Minore e le giuste aspirazioni italiane. L'Esplorazione Commerciale*, Vol. 31, 1916, No. 8, pp. 290-292.

LUKACH, H. C. *Cyprus: Report for 1915-1916*. 23 pp. *Ann. Colonial Repts.* No. 903. London, 1916.

RAEBURN, HAROLD. *A further list of peaks ascended in the Central Caucasus in 1912, 1913, 1914, and 1915. Alpine Journ.*, No. 212, Vol. 30, 1916, pp. 194-196.

SCHULTZ, ARVED. *Afghanistan: Auf Grund einer Reise des Persers Rustam-bek. Petermanns Mitt.*, Vol. 62, 1916, Sept., pp. 330-333.

TOTAH, K. A. *Palestine and the Allies. Journ. of Race Devel.*, Vol. 6, 1916, No. 3, pp. 315-323. [Russian pilgrim, French economist, British politician have had interests in the Holy Land.]

WATSON, A. G. *Aden*. 7 pp. *Suppl. to Commerce Repts.*, Ann. Series, 1916, No. 49a. Bur. of Foreign and Domestic Commerce, Dept. of Commerce, Washington, D. C.

— *Asia, 1:1,000,000. Compiled at the Royal Geographical Society under the direction of the Geographical Section of the General Staff.* Sheets: North—I—38, *Bagdad*; North—K—37, *Batum*; North—I—36, *Beirut*; North—J—37, *Erzerum*; North—J—35, *Izmir (Smyrna)*; North—J—36, *Konia*; North—K—36, *Sinob*; North—J—38, *Tabriz*. War Office, London, 1916. [These sheets represent a southeastern extension of the Map of Europe, 1:1,000,000, discussed in detail in the *Bull. Amer. Geogr. Soc.*, Vol. 47, 1915, pp. 776-777.]

— *Asia Minor, Egypt, Mesopotamia and Persia, Bartholomew's map of.* 1:4,000,000. John Bartholomew & Co., Edinburgh, 1916. [Excellent hypsometric map on a relatively large scale. The altitude tints, in the pleasing greens and browns generally employed by this firm, are bounded by the following contours: 0, 500, 1,000, 1,500, 2,000, 3,000, 6,000, 10,000, and 15,000 feet.]

— *Syrie, Carte de la (partie septentrionale), dessinee d'apres les cartes hydrographiques de la Marine francaise, le Palestine Found [sic], les itineraires de E. G. Rey, de Max Blankenhorn [sic], Sachau, Diener, les cartes de H. Kiepert, le Guide de Terre Sainte du P. Barnabe, et les documents les plus recents.* 1:400,000. Inset: Plan de Beyrouth. 1:25,000. Missions Catholiques, Lyons, 1915. [Relief in brown shading.]

— [*Turkey, etc.:*] *Les operations russo-turques: Mer Noir, Crimee, Caucase, Dardanelles.* 1:850,000. Berger-Levrault & Cie., Paris, [1916].

WORLD AS A WHOLE AND LARGER PARTS

FERNOW, B. E. *A brief history of forestry in Europe, the United States, and other countries.* 3rd revised edit. xi and 506 pp.; index. American Forestry Assoc., Washington, D. C., 1913. \$2.50. 8 x 6.

Why a history of forestry? Doctor Fernow gives the answer and the history.

The need of wood is universal, but the form that the forest problem takes varies from place to place and from time to time. It varies locally within the same country because of many conditions, prominent among which are the means of transport, the local abundance of trees or of men. Changes in one of many factors may make a new forestry situation.

Thus, the people of the eastern United States in 1800, though scanty in number, developed in some localities a keen appreciation of forest care because they depended on wood for fuel and timber and had only wagons and rivers for transport. Then came the railroad and the steamship, and the Pennsylvania farmer, like the people of England, drew upon the world. Forest care was forgot in the sense of plenty that the world market gave.

That sense of plenty is passing, never to return. The north temperate zone contains the world's important forests, for, as Doctor Fernow well points out, the tropical woods are so hard that their uses are ornamental rather than economic. Of this temperate-zone forest, 800,000,000 acres are in Europe, 800,000,000 in Asia, and 900,000,000 in North America. Already all Europe, except Norway, Sweden, Russia, and Austria-Hungary, is importing, and North America with its heavy industrial development has made a wood scarcity in an amazingly short time. This present economic life of ours, despite the seeming mitigation of invention, demands ever-increasing piles of wood. Even Germany, the fatherland of forestry, now imports a sixth of her supply and, like other European countries, increases her demand $1\frac{1}{2}$ to 2 per cent per year. This import to Germany comes in spite of the experience of centuries, with 25 per cent of her area in forests, nearly all well cared for and with the unusual output of over 50 cubic feet of wood per acre per year.

The ray of hope for the race lies in the fact that only 10 per cent of the temperate-zone forests, 250,000,000 acres, are under any care that may be called forestry. This is not a quick hope, as shown by the experience of the city of Nürnberg in one of the first recorded cases—a crop of pine, spruce, and fir was planted in 1368, and harvested in 1440, eighty-one years later.

Germany, populous and inaccessible (in comparison to the rest of Europe), early felt the need for forestry. Her scores of states and cities with independent forest administrations have made her a storehouse of experience, practice, and schooling. This and the experience of the rest of the world has been brought together in good German style by one eminently fitted for it, Professor Fernow, brought up in the schools and atmosphere of Germanic forestry and fortified by decades of observation, practice, and teaching in America.

J. RUSSELL SMITH.

MATHEMATICAL GEOGRAPHY

ASTRONOMICAL GEOGRAPHY

CHAMBERLIN, T. C. **The origin of the earth.** xi and 271 pp.; diags., ill. (The University of Chicago Science Series.) University of Chicago Press, Chicago, 1916. \$1.50. 7½ x 5.

This book is an interesting illustration of where one may be led in a scientific research. An inquiry into the cause of the Ice Age led to an investigation of the origin of the atmosphere and from that to the origin of the solar system. The nebular hypothesis proving unsatisfactory, the author advanced what he has called the "planetesimal hypothesis." This was first published in 1897; since then many papers have been written in developing the hypothesis into a theory. This volume is the first general exposition of the theory that has appeared.

The matter may be divided for review into four parts: (1) criticism of the nebular hypothesis; (2) development of a spiral nebula by the close approach of two stars, and its evolution into the solar system; (3) origin of the larger features of the earth; (4) speculations on the beginnings of life.

(1) The nebular hypothesis was never developed into a theory; and during the second half of the last century so many objections were found to it in the exact form given by Laplace that astronomers looked to the irregular nebulae and later to the spiral nebulae as a more probable prototype of the solar system. The author and Professor T. R. Moulton, his collaborator, showed that the distribution of mass and momenta in the solar system were not compatible with the usual simple assumptions of Laplace's hypothesis; they also emphasized the difficulty offered by the nearly universal forward rotation of the sun, the planets, and their satellites.

(2) The solar prominences consist of matter erupted from the sun by some not clearly understood force. The author assumes that, if the pressure a little below the sun's surface could be reduced, a sufficient mass would be ejected to form the planets and their satellites, which, all told, only amount to about 1/745 of the sun's mass. The author ascribes to the tidal forces due to the approach of a star the role of reducing the pressure.

There are three objections to this hypothesis: (a) The cause of the eruptions is unknown, and therefore a reduction of pressure might or might not increase their violence. (b) The action of the tidal forces is inadequately described; the radial components of these forces have little effect in producing the tides, which are principally due to a heaping up of matter from the surrounding regions by the actions of the tangential components of the forces; and they are more apt to cause an increase than a decrease of pressure on the levels from which the eruptions start. (c) The author does not tell us how large the star must be, nor how near the sun it must come, but he speaks of it as "massive" and its approach to the sun as "quite distant." In his "Geology," he instances a star of the same mass as the sun and the nearest approach about ⅔ the distance of Neptune. The maximum ratio to the sun's gravity of the tidal forces on the sun (due to this star) is one part in 32,000 million. If the star had four times the mass of the sun and approached to within half the above distance, the ratio would only be one part in a thousand million. Does any one doubt that the ordinary storms on the sun cause much greater changes in the pressure than this would?

Assuming, however, that the ejections from the sun have occurred as described by the author, the theory accounts for the revolution of all the planets in the same directions and approximately in the same plane, and shows that the growth of the planets, by impact with small masses (planetesimals), would tend to reduce the eccentricities of the orbits, but it may be doubted whether this could produce the very nearly circular orbits which all the planets describe. One of the most serious faults of Laplace's

hypothesis, according to the author, is that it would require retrograde, and not forward, rotations of the planets and revolutions of their satellites. The author explains the forward rotations and revolutions as the result of impact of planetesimals on the growing planet; and points to the relative sizes of certain shaded areas in his Figure 7 as "essentially decisive" of this. These areas have apparently been drawn on the erroneous impression that the direction of the impulse is in the direction of motion of the plane at the moment of impact. When the true direction of the impulse is determined by the instantaneous change in velocity, it is found that the effect of the impacts is merely to reduce the speed of rotation of the planet, in whatever direction that rotation may have been. So that the direction of the axes and the directions of rotation of the planets depend on the way the matter was erupted from the sun, of which nothing is known; and the nearly universal direct rotations are not accounted for by this theory. The author apparently recognizes the accidental directions of rotation of the larger planets (p. 154).

(3) The earth is supposed to have grown by slow accretions of planetesimals, which cooled rapidly by radiation on account of their small size. The interior heat is ascribed to a contraction of the mass, and a surface temperature gradient to heat brought by molten rock from the deep interior and to radio-activity. Somewhat plausible reasons are given why the heavier matter found lodgment in the depressed regions, and, by greater compression there, made the positions of the oceans and continents permanent.

The rate of rotation of the earth is supposed, towards the end of its growth, to have been diminished by accretions, and the depression near the equator and elevation near the poles, necessary for adjustment to the new figure of equilibrium, are supposed to be accomplished, not by plastic flow, but by fractures of the earth into great segments. By analogy with the jointing of basalt columns (!) the author thinks there would be three great fractures at each pole, and that the whole earth would be broken up into six segments, diamond-shaped at the earth's surface, and interlacing in the equatorial regions; and that these segments would sway on their apices at the earth's center, adjusting the earth to its proper figure. As the earth shrinks, crushing occurs on the land segments along the lines of junction of the segments, and mountain chains are formed. The reviewer is quite incapable of understanding how the almost perfectly ellipsoidal shape of the earth could be brought about by such movements of the segments; nor do the fracture lines drawn by the author, more numerous than required by the original analogy, follow the great structure lines of the earth; new hypotheses have to be introduced to account for these discrepancies. The three heavy segments of the North and South Pacific and the Indian Oceans are supposed, by their weight, to have forced the segments opposite to them to yield, "and by such yielding to have formed the land hemisphere," a perfect analogy to a man's lifting himself by his own boot straps. In describing the certain forces which increase toward the earth's center the author writes: "Their action was not unlike a vial closing from below," though, of course, the forces acting on a body in the jaws of a vise are the same whichever jaw approaches the other. But perhaps the author should be forgiven this error, for it is remarkably prevalent in geologic literature.

The author recognizes the purely speculative character of many of his ideas, and writes: "We are painfully conscious of the high probability that we have fallen into some misconceptions, perhaps not a few, and have entertained views that will need to be rectified."

HARRY FIELDING REID.

EDUCATIONAL GEOGRAPHY

HAWORTH, ERASMUS, AND OTHERS. **Should a new degree be created for proficiency in geology?** *Economic Geol.*, Vol. 11, 1916, No. 1, pp. 73-86. [Opinions elicited by a circular letter on this question.]

KELTON, M. E., AND C. W. HOTCHKISS. **An experiment in fourth-grade geography.** *Journ. of Geogr.*, Vol. 14, 1915-16, No. 7, pp. 245-251.

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